



Patent  
254/157

#3

## RELATIVE TABS

### FIELD OF THE INVENTION

The present invention relates to a method and apparatus for aligning items within an  
5 electronic document.

### BACKGROUND TO THE INVENTION

The positioning of items, such as text, text and dialogue boxes, images, and the like,  
within an electronic document is currently achieved in one of a number of ways. This includes  
10 using the tab settings, specifying a position for the item, or simply arranging for the item to be  
displayed in a particular location.

The most popular method of locating items within documents is to use tab settings. The  
tab settings specify a modifiable position at which various items can be located. The tab settings  
specify the position as a distance from the left hand margin and are therefore absolute in  
15 character. Accordingly, if items are to be aligned in a vertical fashion, each item must have the  
same horizontal tab setting.

Alternatively, the actual position of an item within a page can also be specified by using  
horizontal and vertical advance settings. These similarly operate to position the item at a  
absolute specified position in the page.

20 Similarly, the item can be arranged to be displayed in a certain position, for example by  
using a suitable number of carriage returns and spaces to allow the item to be positioned as  
desired. However, all of the above systems suffer from the disadvantage that they position the

items absolutely relative to the margins, and/or page edges. As a result, if it is desired to have a particular page arrangement, it is necessary to specify the position of each item absolutely. This results in a large number of complications should it be necessary to insert additional items at intermediate locations, or the like. Similarly, problems arise when documents are imported  
5 between software packages that utilize different tab setting scales. This can lead to the undesirable reformatting of documents when displayed on a different computer.

### SUMMARY OF THE INVENTION

In accordance with the first aspect of the present invention, we provide a method of  
10 aligning items within an electronic document, each item having a relative tab indication, the method according to an embodiment comprising the steps of:

- a. determining the relative tab indication of the first item;
- b. positioning the first item within the document; and,
- c. for each further item:  
15 i. determining the relative tab indication of the item;  
ii. positioning the item within the document in accordance with the relative tab indication and the position of each previously positioned item.

In accordance with a second aspect of the present invention, we provide apparatus for aligning items within a document, the apparatus according to an embodiment including a display  
20 for displaying the document; and, a processor, the processor being adapted to:

- a. determine the relative tab indication of the first item;
- b. position the first item within the document; and,

- c. for each further item:
  - i. determine the relative tab indication of the item;
  - ii. position the item within the document in accordance with the relative tab indication and the position of each previously positioned item.

5       Accordingly, the present invention provides a method and apparatus which when suitably used allows items to be relatively positioned within a document. By positioning the items relative to each other, as opposed to absolutely with respect to the page, this allows for a greater versatility in the page layout. In particular, utilization of this method and apparatus means that items can be automatically aligned on a page. Furthermore if additional items are inserted, the  
10   position of the original items is automatically adjusted to ensure that correct alignment is maintained.

      Usually any items with a relative tab indication greater than the tab indication of a previously positioned item are displaced from the previous item in a first direction. Typically, when this involves placing an item within a document on a computer screen or the like, the item  
15   having the higher tab value is positioned to the right of the item having the lower tab value.

      If an item with no tab indication is to be positioned, this is normally displaced from a previous item in the first direction. Accordingly, it can be positioned on the same line as, but located to the right, of the previous items.

      For any items having a relative tab indication less than the relative tab indication of a  
20   previously positioned item, the item is usually displaced from the previous item in a second direction opposite to the first direction. Thus, if an item having a lower tab indication is to be positioned, it is normally placed to the left of the higher relative tab indication item.

In this case, the item having a relative tab indication less than the relevant tab indication of the previously positioned item is also usually displaced from a previously positioned item in a third direction perpendicular to the first direction. Thus, the item having the lower tab indication is usually positioned below and to the left of the item having a higher tab indication value.

Typically any items having a relative tab indication equal to or greater than the relative tab indication of previously positioned items are aligned with the previously positioned items in the first direction. Thus, items having identical tab indication values are vertically aligned within documents.

Typically each relative tab indication includes at least one of first and second tab values. Each relative tab value representing the relative tab position of a specific portion of the item. This allows the start and end of items to be located within a document allowing documents to be designed as required.

Typically each item has a predetermined size. In this case, the method usually comprises positioning each item so as to ensure a predetermined distance exists between items in the first direction. It will be realised, that the predetermined size may either be set by the user, or if no value is set, be a default value.

Accordingly, the items are positioned in a first direction in accordance with the relative tab indication with the method further comprising adjusting the relative positioning to maintain at least a predetermined separation between the items.

The apparatus for aligning items within a document also includes a store for storing the relative tab indications of items to be positioned, the processor being adapted to cooperate with the store to allow the processor to determine the relative tab indications therefrom.

Typically, the apparatus also includes an input device for allowing the user to input  
5 relative tab indication values. This will typically consist of a computer or the like. Alternatively however, the tab indications can be downloaded directly from an external source.

The present invention also relates to a document having a number of items therein the document being created using apparatus according to the second aspect of the invention or having the items aligned in accordance with a method according to the first aspect of the present  
10 invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of a processing system for implementing the present invention;

15 Figure 2A is a first example of items aligned within a document in accordance with the present invention;

Figure 2B is a second example of items aligned in a document in accordance with the present invention;

Figure 2C is a third example of items aligned within a document according to the present  
20 invention;

Figure 3 is an example of the input screen used for constructing a document in accordance with the present invention;

Figure 4 is an example of a list screen showing the defined items for a document;

Figure 5 is an example of the constructed document defined by the list shown in Figure 3;

Figures 6A to 6C show three stages of the construction of a document using the item list shown in Figure 4; and,

Figures 7 to 15 are examples of documents generated in accordance with the examples set out in Appendix A.

Figure 16 is a diagram of a system architecture with which the present invention can be implemented.

Figure 17 is an additional diagram of system architecture with which the present invention can be implemented.

#### DETAILED DESCRIPTION OF THE DRAWINGS

Figure 1 shows a processing system 1 suitable for implementing the present invention.

The processing system includes a processor 2, a memory 3, a display 4 and an input device 5 all of which are interconnected via a bus 6.

As will be appreciated by a person skilled in the art, the processing system may therefore be any processing system which can implement a software program on the processor 3. Thus, for example, the processing system 1 could comprise a personal computer, a unit work station, a laptop, a palm top, a wireless communication s system or the like. Additionally, it will be appreciated that the processing system may be interconnected to other processing systems via a communications network (not shown).

In use, the processor 2 is adapted to implement a program, such as a design generator which can be used for designing forms or the like. Examples of design forms are shown in Figures 2A, 2B and 2C.

As shown in Figure 2A, the document includes a number of items 10,11,12,13,14 each of which includes a prompt 10A,11A,12A,13A,14A and a box 10B,11B,12B,13B,14B. The document, once designed is typically used for data entry purposes. Accordingly, it is desirable to have the boxes aligned such that the document has a readily understandable appearance. In this example, the boxes 10B,11B,12B have both the start and ends of the boxes aligned. In contrast to this, the boxes 13B,14B only have the ends of the boxes aligned as shown. In addition to this, the prompts 13A,14A of the items 13,14 are vertically aligned.

Additionally, as shown in Figure 2B, it is possible for items to be combined into a group shown at 15. In this example, a box 18B is aligned with the start of the group 15, as shown. In this case, the start of boxes 16B,17B are aligned.

A further example is shown in Figure 2C. In this example, the start of the box 18B is aligned with the start of the boxes 16,17, as shown.

Operation of the system to allow relative tabs to be defined will now be described. Firstly, the software program implemented by the processor 2 causes an item entry screen to be presented to the user on the display 4. An example of a suitable screen is shown in Figure 3. The screen includes a template/library object field 20 a prompt field 21, an align prompt tick box 21A, a display type field 22, a show meaning field 23, a width field 24, a height field 25, an item to start tab field 26, and a item tab end field 27. Also provided are an alignment field 28 and a format mask field 29.

In use, when the operator is generating a form or document with aligned items, the user will enter details of each item by entering appropriate details in the relevant fields 20-29. Thus, the templates/library object field 20 is used if a particular template is to be used for the item.

The prompt field 21 is used to specify the prompt which is associated with the respective  
5 item. If the align prompt start tick box is checked, this will cause prompts to be aligned, as will be described in more detail below. The display type and show meaning fields 22,23 are used to specify the type of data that can be entered into each item. The width and height fields 24,25 are used to set the width and height of each item box. If no values are entered in these fields, then predefined default values will be used.

10 The item tab start field 26 and the item tab field 27 are then used for entries of relative tab values. The tab values are used for aligning the item with other items on the page. In general, items having equal tab values will be vertically aligned and items having larger tab values will be displaced to the right in the document, as will be explained in more detail below. Alignment and format mask details can also entered in the appropriate fields 28,29.

15 Once the details of a particular item have been entered, a next button 30 can be used to allow subsequent items to be entered. In this case, once the next button is pressed, the data entered in the fields 20-29 will be downloaded into an item list, as will be explained. The fields will then be cleared to allow new items to be defined. Previous items can be edited by clicking on the back button 31. Once all items have been entered, the finish button 32 is pressed.

20 Once an item has been defined using this system, the processor 2 operates to place the defined item in an item list. An example of an item list is shown in Figure 4.



Figure 4 shows a list screen which sets out in order the details of each item. For clarity purposes, only the name, item tab start value, item tab end value and the line prompt start details are shown in this representation. The item list shown in Figure 4 is editable, allowing users to add, remove or alter items within the list.

5        Thus, the first item in the list is a "Product Code" item, which has an item tab start value of 100. The next item is a "Preview" item having an item tab start of 100 and the third item is a "Title" item having a item tab start value 100.

In use, the processor 2 operates to place items in the document in the order they are entered on the item list. Thus, the processor 2 will access the first item on the list to determine  
10    that it has an item tab start value of 100 and position the item within the document, as will be explained in more detail below.

The processor 2 then identifies each next item on the list in turn and positions it in accordance with the position of the previously positioned items, and the defined relative tab values. Once this has been completed, the processor adjusts the relative positioning of the  
15    relative tab values to minimise the space utilised in the document.

For the item list shown in Figure 4, this results in the generation of the document shown in Figure 5. In this example, the list is converted into a Product Code item 40, a Preview item 41, a Title item 42, a Type item 43, a Default Days item 44, a Price Code item 45, a Price item 46, a Medium item 47, a Game Category item 48, a Minimum Memory item 49, a Movie  
20    Category item 50, an Age Classification item 51, a Duration item 52, an Audio item 53, a Monochrome check box 54 and a Description item 55.

In order to be able to align items in this manner, the processor 2 initially positions the items on respective vertical tab lines, shown as the dotted lines 100, 200, 300, 400 in Figure 5, in accordance with the relative tab values.

The tab lines 100, 200, 300, 400 are notional vertical lines within the document which are generated by the processor 2 to aid with the alignment of items. Each tab line is assigned a tab value corresponding to one of the tab values of the items to be arranged. Any subsequent items having the same tab value can simply be positioned on the same tab line, thereby ensuring that the items are vertically aligned as required.

Once all the items have been positioned on respective tab lines, in accordance with the relative tab values, the processor operates to minimise the spacing between the tab lines, thereby minimising the space utilised in the document.

The processor 2 initially positions the items using the following procedures.

1. The first item to be encountered is positioned on an appropriately valued tab line at the top left hand corner of the document, as shown by the Product Code item 40. This may be subsequently moved depending on the positioning of other items (see for example step 4 below).
2. Any items having a higher tab value are aligned with a new higher value tab line, vertically to the right of the previous lower value tab line.
  - a. If possible, the item is placed on the same horizontal line, as shown for example by the Preview item 41 which is positioned to the right of the Product Code item 42.
  - b. Alternatively, the item is placed on a lower horizontal line, as shown for example by the Default\_Days item 43 which is positioned to the right of the Title item 42.

3. Any items having an identical tab value are positioned on the corresponding valued tab line, aligned with the relevant start or end of the previously positioned item. This is achieved by placing the item on a lower horizontal line. As shown for example by the start of the box of the Title item 42, which is positioned below the start of the box of the Product Code item 40.

5 4. Any items having a lower tab value are positioned on a tab line to the left of a higher value tab line, on a lower horizontal line. As shown for example by the Price Code item 44 which is positioned to the left of the Default Days item 43. This may require the repositioning of previous items.

5. The prompts of any items having the align prompt start box ticked will be vertically aligned with the prompt of other items having the same tab values.

6. Any items not having a tab value will be positioned on the same line as the previous item, displaced to the right in the document.

Once this has been completed, the processor operates to minimize the spacing used in the document. This is achieved by having the processor move the higher value tab lines towards the lower value tab lines. This process is continued as far as possible, whilst ensuring that:

- a. all items remain aligned with the appropriately valued tab line; and
- b. items on the same horizontal line are positioned as close together as possible, whilst maintaining at least a predetermined gap between the items.

Thus, each line in turn (from the lowest tab value to the highest) is progressively moved towards the lower tab value line until only a predetermined gap exists between an item on the line and an item on a lower tab value line.

The first stages of the construction of the document are shown in Figures 6A to 6C.

Thus, the processor 2 initially positions the Product Code item 40 on a new tab line 100 in the top left hand corner of the document. The Preview item 41 is then positioned on a tab line 400 to the right of the tab line 100 and hence to the right of the Product Code item 40, as shown in

5 Figure 6A.

Next, the Title item 42 is added as shown in Figure 6B. In this case, the Title item has an item tab start of 100 and accordingly the start of the item is placed on the tab line 100. The item also has an item tab end 300 which is aligned with a new tab line 300. Accordingly, the tab line 400 and hence the preview item must be displaced to the right hand side of the document to  
10 accommodate the Title item, as shown. In this case, the Title 42B box of the Title item has a predetermined length which therefore defines the relative separation of the 100 and 300 tab alignments. As a result, all subsequent items must be positioned to match the length of the Title box 42B. If the Title box did not have a defined length, then the length would initially be set to a default value, although this may be subject to extension to ensure the 100 and 300 tab positions  
15 are acceptable.

The Type item 43 and the Default Days item 44 are then added on the next horizontal line, as shown in Figure 6C. In this case, the start of the box 43B of the Type item 43 is aligned with the tab line 100 and hence with the boxes of the Title and Product Code items 42,40, whilst the Default Days item 44 is added to a new tab line 200. Once the distance between the tab lines  
20 is minimised, this will result in the Default Days item being positioned as close to the Type item as possible. In this case, the Default Days item 44 is positioned to the left of the end of the Title box 42B as it has a lower relative tab value.

The remainder of the items are positioned in a similar manner before the distance between tab lines is minimized so as to result in the arrangement shown in Figure 5.

In the case of groups of items, it is possible for the system to define a group of items as being interconnected. Once this is completed, the group of items can be aligned with other  
5 items or other groups of items, as required. This is achieved in a similar manner to the aligning of individual items and will not therefore be described in any detail.

Thus, the relative tab stops are numeric values that enable the user to position and align items groups relative to each other (i.e. next to each other or below each other). Using relative tab stops also enables you to explicitly specify that a particular item or item group is  
10 to appear on a new line.

The user sets relative tab stops for both items and item groups using either or both of the following relative tab stop properties:

- Start Tab Stop property
- End Tab Stop property

15 The Start Tab Stop property and the End Tab Stop property determine whether it is the left hand edge, the right hand edge, or both edges of the item/item group that are aligned. The prompts can also be aligned using the item's Align Prompt property.

When using relative tab stops, the user can set the Tab Stop Scope property of a container object (i.e. an item group or module component) to align:

- 20 ○ items within an item group with items outside the item group
- items within one module component with items in another module component

The general procedures the user should follow when defining the items to be arranged are shown in Appendix A, with detailed examples of the use of relative tabs shown in Figures 7 to 15, and described in Appendix B.